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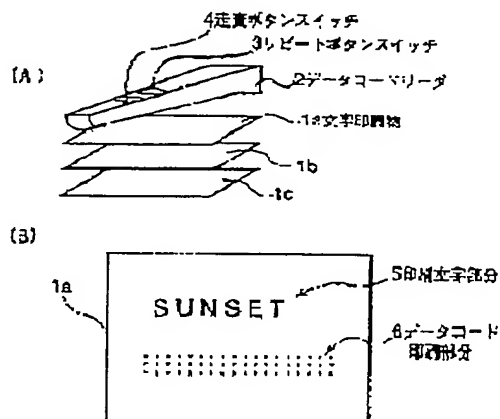
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## (54) PRINTED MATTER WITH DATA CODE AND DATA CODE READER

### (57)Abstract:

PROBLEM TO BE SOLVED: To allow a reader to read a card to be read and reproduce it by providing character printed matter with a printed part of optically readable data code containing speech information.

SOLUTION: This reader device is comprised of character printer matter 1a-1c, a data code reader 2, a repeat button switch 3 for the data code reader 2, and a scanning button switch 4 for the data code reader 2. Also, a character printing part 5 is provided with a printed character part 5 and an optically readable printed data code part 6 containing speech information at least. The data code reader 2 is a pen-type reader, and optically reads the printed data code part 6 containing at least speech information by manual scanning. The repeat button switch 3 is a switch to repeat reproduction of read speech information. The scanning button switch 4 is turned on by pushing the switch at the time of scanning the printed data code part. Turning on the scanning button switch activates the data code reader 2 to read the data code.



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## CLAIMS

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[Claim(s)]

[Claim 1] Printed matter with a data code characterized by the thing in which it consists of two or more alphabetic character printed matter which has a printer graphic part, and two or more pattern printed matter which has a printing pattern part corresponding to two or more of the alphabetic character printed matter, and said alphabetic character printed matter contains speech information at least, and for which it has optically the data-code printing part which can be read.

[Claim 2] Printed matter with a data code according to claim 1 characterized by the 2-dimensional dot code which arranged the dot to two dimensions being printed by said data-code printing part.

[Claim 3] The data-code reader characterized by having the repeat switch which is the data-code reader which reads optically the data-code printing part which contains speech information at least, and repeats playback of speech information.

[Claim 4] It is the data-code reader according to claim 3 which said data-code reader is a pen mold reader which reads a data-code printing part by manual scan, and is characterized by said repeat switch being a switch of the push button mold formed in said pen mold reader.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention belongs to the printed matter with which speech information is printed as a data code in which machine reading is possible, and its data code to the technical field of the equipment (machine) which reproduces read information. Especially, it is related with cards with the speech information or the study card of cards appearance, and a data-code reader with a repeat switch.

[0002]

[Description of the Prior Art] Cards or the study card of cards appearance consists of two or more alphabetic character printed matter with which the alphabetic character was usually printed, and two or more pattern printed matter with which the pattern corresponding to two or more of the alphabetic character printed matter was printed. And it is used by discovering the pattern printed matter which reads out the alphabetic character printed by one chosen from among two or more alphabetic character printed matter (for example, a teacher), and corresponds from two or more pattern printed matter shown (for example, a student). A special (for example, he is English teacher) speaker performs this reading raising, it records in the video CD (compact disk), the personal computer CDROM, etc., and there are some which were constituted so that it might be reproduced with the equipment which has a random optional feature.

[0003]

[Problem(s) to be Solved by the Invention] However, by the conventional approach of reproducing with equipment, while reading raising of the model pronunciation by the special speaker is performed, there is a field whose study effectiveness of a reading tag being lost, reading and reading a tag is lost. Then, the purpose of this invention can be used for cards or the study card of cards appearance, has the study effectiveness of reading a reading tag, and is to offer printed matter with a data code and a data-code reader reproducible [ with equipment ] moreover.

[0004]

[Means for Solving the Problem] The above-mentioned purpose is attained by following this invention. That is, this invention is "printed matter with a data code with which it consists of two or more alphabetic character printed matter which has a printer graphic part, and two or more pattern printed matter which has a printing pattern part corresponding to two or more of the alphabetic character printed matter, and said alphabetic character printed matter contains speech information at least and which has optically the data-code printing part which can be read." According to this invention, since alphabetic character printed matter and pattern printed matter consist of two or more corresponding printed matter, they can be used for cards or the study card of cards appearance. Moreover, it has the study effectiveness which contains speech information in alphabetic character printed matter at least of reading a reading tag since it has optically the data-code printing part which can be read, and printed matter with a data code reproducible [ with equipment ] moreover is offered. Moreover, this invention is "printed matter with a data code with which the 2-dimensional dot code which arranged the dot to two dimensions is printed by said data-code printing part." According to this invention, since the 2-dimensional dot code is printed, the amount of information per unit area can record large prolonged speech information, and repetition playback can be performed.

[0005] Moreover, this invention is "a data-code reader which has the repeat switch which is the data-code reader which reads optically the data-code printing part which contains speech information at least, and repeats playback of speech information." According to this invention, since it has the repeat switch which repeats playback of speech information, the data-code reader which can perform asking again repeatedly easily is offered. Moreover, this invention is "a data-code reader which said data-code reader is a pen mold reader which reads a data-code printing part by manual scan, and is the switch of the push button mold with which said repeat switch was formed in said pen mold reader." According to this invention, the data-code reader is small and can perform reading of a data-code printing part and a reproductive repeat by very easy actuation.

[0006]

[Embodiment of the Invention] Next, the gestalt of operation explains this invention. Drawing 1 is drawing of the printed matter with a data code of this invention in which coming out on the other hand, and showing an example of a certain two or more alphabetic character printed matter and data-code reader. Drawing 1 (A) is drawing showing the condition of scanning a data-code printing part by the data-code reader in two or more alphabetic character printed matter which has a printer graphic part and a data-code printing part. For 1a, 1b, and 1c, as for a data-code reader and 3, in drawing 1 (A), alphabetic character printed matter and 2 are [ the repeat button switch of the data-code reader 2 and 4 ] the scan button switches of the data-code reader 2. Moreover, drawing 1 (B) is drawing

showing an example of the printing side of alphabetic character printed matter. In drawing 1 (B), it is the data-code printing part [ the optical target with which 5 contains a printer graphic part and 6 contains speech information at least ] which can be read.

[0007] As shown in drawing 1 (A), the data-code reader 2 is a pen mold reader, and reads optically the data-code printing part 6 which contains speech information at least by manual scan. Moreover, the repeat button switch 3 is a switch for repeating playback of the read speech information. Moreover, in case the scan button switch 4 scans a data-code printing part by the data-code reader 2, it pushes a switch and sets it to ON. The data-code reader 2 performs reading actuation of a data code by setting the scan button switch 4 to ON.

[0008] Drawing 2 is drawing showing two or more pattern printed matter which is another side of the printed matter with a data code of this invention. In drawing 2, 7a, 7b, 7c, 7d, 7e, and 7f are pattern printed matter which has a printing pattern part corresponding to alphabetic character printed matter. Two or more above-mentioned alphabetic character printed matter and two or more of these above-mentioned pattern printed matter have correspondence relation. For example, the pattern printed matter corresponding to "SUNSET" which is the matter described by certain alphabetic character printed matter 1a is pattern printed matter 7a, and "the setting sun" is drawn by pattern printed matter 7a as shown in drawing 2.

[0009] Drawing 1 is cards or the study card of cards appearance so that clearly from the above-mentioned configuration, alphabetic character printed matter (\*\*\*\*) and pattern printed matter (picture card) serve as a group, and the printed matter with a data code of this invention is constituted by two or more printed matter. In drawing 1 and drawing 2, at random [ so that the regularity of the pattern printed matter 7a and 7b of two or more sheets and ... may be lost about each arrangement of pattern printed matter ], it is arranged on a flat surface so that there may be no lap. On the other hand, the alphabetic character printed matter 1a and 1b of two or more sheets and ... pile up at random so that regularity may be lost about each arrangement of alphabetic character printed matter.

[0010] And reading by the data-code reader 2 is performed to the alphabetic character printed matter of the top of the usually piled-up alphabetic character printed matter. Reading is performed by carrying out the manual (for example, teacher) scan of the data-code printing part top of alphabetic character printed matter, pushing the scan button switch 4 with a finger. The data code which contains speech information at least by this manual scan is read optically. The data-code reader 2 performs data processing to the read data code, and reproduces voice (it mentions later).

[0011] Then, when repeating the read speech information and reproducing, playback is performed by pushing the repeat button switch 3 with a finger. In addition, in drawing 1 (A), although the repeat button switch 3 and the scan button switch 4 are shown as a separate switch, \*\* which is made to perform the function of these switches with one switch is made. For example, if a button switch is double-clicked, it will operate as a repeat button switch 3, and if a button switch is kept pushed, it can constitute so that it may operate as a scan button switch 4.

[0012] Playback of voice performs [ from ] discovering the pattern printed matter corresponding to the reproduced voice among the pattern printed matter 7a and 7b of two or more sheets arranged at random. and ... Usually, the action discovered by two or more persons (for example, student) is performed, and the discovered pattern printed matter becomes a person's thing discovered first. A game will be ended, if the piled-up alphabetic character printed matter is reproduced in an order from a top, a game is advanced, the last alphabetic character printed matter is reproduced and corresponding pattern printed matter is discovered. And victory or defeat and ranking of a game are determined by some of discovered pattern printing significant work.

[0013] Thus, when the reproduced voice is the linguistic study vocabulary, training of listening comprehension is performed by hearing it carefully. Moreover, study of the concept which the vocabulary means is performed to coincidence by discovering the pattern printed matter corresponding to the reproduced voice. Moreover, when reading the printer graphic part of alphabetic character printed matter 1a (1b, 1c, ...) (for example, a student), it has the study effectiveness of reading, and it can check by proper pronunciation which equipment moreover reproduces. And it can advance, enjoying them.

[0014] Here, the data code of the data-code printing part 6 shown in above-mentioned drawing 1 (B) is explained. Into the data-code printing part 8, the 2-dimensional dot code which arranged the dot to two dimensions can be printed. The 2-dimensional data code which can be used by this invention can use a dot code which was indicated by JP,6-231466,A.

[0015] Drawing 3 is drawing showing an example of the configuration of the 2-dimensional data code which can be used by this invention. For a block and 43, as for a block address and 45, in drawing 3, a marker and 44 are [ 41 / a dot code and 42 / error correction data and 46 ] data areas. With an example of this 2-dimensional data code, the data format of the dot code 41 consists of data areas 46 into which data, such as voice and an image, actually go with the error detection of a marker 43, a block address 44, and the address, and the error correction data 45 for one block 42. A pattern out of which a marker 43 does not usually come in a record modulation is used. Moreover, the block-address data 44 are data showing the location of the block, and error detection and the error correction data 45 are used for the error judging of the address. Like a bar code, in "1", such record data of a format are printed [ data / "1" or "0" / 0 / those with a black dot, and / "0" ] by carrying out as he has no black dot.

[0016] Drawing 4 is drawing explaining the detail of the 2-dimensional data code which can be used by this invention. As drawing 3 also showed the block 42, it is arranged by two dimensions and the block address 44 is added, respectively. Each address is attached to the block address 44. For example, the data code of the data-code printing part 6 shown in drawing 1 (B) consists of ten blocks, and in the data-code printing part 6, as shown in drawing 4 (A), it makes the block of most the upper left a block address (1 0). To it, the block of the right continues

with (1, 3), and (1, 4) like a block address (1 1) and the following (1 2), it moves from it to a lower stage, and a block address is given to all the address blocks 42 from the left in the format of (1, 5), (1, 6), (1, 7), (1, 8), and (1, 9). Of course, the number of blocks 42 can be freely changed with the amount of the data which should be recorded.

[0017] Here, about the marker of the bottom, and the marker of a rightmost stage, it considers as the dummy marker 48. That is, the block 42 to a certain marker 43 is data of the diagonal below surrounded by four markers 43 containing it, and its marker of the bottom and a rightmost stage is the auxiliary marker 48 stationed in order to define the 2nd step and the block to the 2nd step of marker from the right, i.e., a dummy marker, from the bottom.

[0018] Next, the block 42 is explained. As shown in drawing 4 (B), the error detection of a block address 44 and its block address and the correction data 45 are given among younger markers to the marker 43 of the block 42. Moreover, the block address 44 same among the marker 43 and right marker, its error detection, and the correction data 45 are given. Although a marker is in the upper left of a block and the block address was arranged and shown in the lower right by drawing 3, it is considering as the form which has arranged the block address 44 to left-hand side and the up side, and has stationed the marker 43 to the upper left hand corner in drawing 4. In addition, although the block address 44 has shown the example recorded in 1 block at two places, one place is sufficient as this. However, even when a noise is in one block address and an error is caused by recording on two places, since the address of another side can detect and higher dependability is acquired, recording on two places is desirable. In addition, the location and the location of a block address of the data of a block to a marker with a \*\*\*\*, the location of the dummy marker on the code decided by it, etc. are examples, and this invention is not limited to this.

[0019] Next, a marker's 43 example of a pattern is explained. As shown in drawing 4 (C), with this example, pattern 43A of the circular black whose diameter is 7 dots is used as a marker 43. And a marker's black part is made easy for surrounding partial 43B of the black dot 43A to consider as white, and to distinguish. Moreover, reference number 43C in this drawing is an auxiliary line for explanation. Although he wants to make the range of white partial 43B as small as possible for raising recording density, it has easy and a demand of wanting to take greatly in order to carry out to a high speed, in marker appearance processing. Then, it has set up so that range 43C for pattern 43A of black in case rotation is 45 degrees to distinguish enough may enter in partial 43B.

[0020] In addition, the image scale factor of the image formation optical system in a data-code reader (it mentions later) makes magnitude of the data dot 49 of a data area 46 the image scale factor which carries out image formation to 1.5 pixels, as shown in drawing 4 (D). A pixel here means 1 pixel of the image sensor of the image pick-up section of a data-code reader. That is, image formation of 1 dot recorded on data-code printing partial 21a - 21e, for example, the 30-40-micrometer dot, shall usually be carried out through an image formation system lens to 1.5 pixels of the pixel on the image sensor (7 micrometers and 10 micrometers) which is magnitude. Although what is necessary is just to make a pixel pitch below into a dot pitch in a sampling theorem, in order to raise the dependability of detection, the example shown in drawing 4 (D) detects a dot pitch by 1.5 pixels.

[0021] By making a data code into the above-mentioned method (2-dimensional block division method), it has the advantage of following \*\* - \*\*. That is, if the dot pitch for every \*\* dot is below the resolution of an image sensor, even if data dot sizes differ, reading of a code (set of a unit data block) will become possible. \*\* To a code, even if the image pick-up section inclines, reading becomes possible. \*\* Even if spacing of a data dot varies, it is reproducible with the variation in a scan speed. \*\* According to the total amount of data, expansion is possible freely two-dimensional about the unit block, consequently code size can be changed freely. \*\* Since the block address is added, respectively, playback becomes possible even if it begins to read from the middle of a code. \*\* If it is a block unit, the configuration of a code can be arranged freely. \*\* A predetermined start code [ as / in a bar code ] and stop code are unnecessary, and a clock code is also unnecessary.

[0022] Moreover, since it has these descriptions, even if there is blurring, the handicap reader of a manual scanning-type whose playback is possible is realizable [ with this 2-dimensional block division method ]. That is, four adjoining markers are detected by the reader side, and since the normalize is performed because only the number of dots carries out the division-into-equal-parts rate of between markers, there is an advantage that it is strong to dispersion in data line spacing at the time of record, blurring at the time of playback, etc. in expansion, contraction, deformation, etc. strongly.

[0023] In addition, it is the magnitude whose 1 dot is dozens of micrometers about the dot 49 in a data area 46, for example. This should just set up the scale factor of the data on a film suitably by application and the application at the time of a print. Generally, it may be 40 micrometers, 20 micrometers, or 80 micrometers. A data area 46 is the magnitude of 64x64 dots. These can be freely expanded or reduced even to the range which can absorb the error by the above-mentioned division-into-equal-parts rate. Moreover, in the case of the magnitude and this example which are not in the modulated data, the above-mentioned marker 43 is a round shape-like, and makes it circular black marker 43A which has the diameter of 7 or more dots and about 7x7 dots as opposed to the dot of a data area 46.

[0024] Next, a data-code reader is explained. The data-code reader which can be used by this invention can use a data-code reader which was indicated by JP,6-231466.A. Drawing 5 is drawing showing an example of the configuration of the data code of the pen mold which can be used by this invention. As for an earphone and 51, in drawing 5, 50 is [ a pen mold data-code reader and 52 ] touch sensors, the lens for [ set inside the pen mold data-code reader 51 and / 60 ] image formation in the light sources, such as LED, and 61 and 62 -- a spatial filter and 63 -- for the image-processing section and 66, as for the data output section and 68, the data-processing section and 67 are [ the image pick-up sections, such as image sensors, and 64 / an amplifier and 65 / the control section and 69 ] the dc-batteries as a power source of operation. [ moreover, ]

[0025] As shown in drawing 5, the pen mold data-code reader 51 detects a data code by the control section 68

which performs the light source 60, a lens (image formation optical system) 61, a spatial filter 62, the image pick-up section (image sensors) 63, an amplifier 64, an image pick-up control section, etc. Moreover, data processing of the data detected and obtained is carried out by functions, such as the scan conversion which the image-processing section 65 and the data-processing section 67 have, binary-ized processing, a recovery, data error correction, expanding processing, a data interpolation, and address sequence detection. And the data is changed into a sound signal by the data output section 67, and is reproduced from an earphone 50. In addition, in this drawing, although only the output unit of audio information is shown, in building in the processing sections, such as an image, and an alphabetic character, a line drawing, naturally it makes the output unit according to it connectable. About the concrete device of operation in which a data code is read by the pen mold data-code reader 51 of a configuration as shown in drawing 5, since it is indicated by above-mentioned JP.6-231466.A and is, explanation is omitted here.

[0026] Moreover, the touch sensor 52 is formed in the side face of this pen mold data-code reader 51. This is a switch for repeating playback of the data code both read as directing the timing which incorporates a data code, and performing it. As this touch sensor 52, a piezo-electric switch, a microswitch, piezo-electric rubber, etc. are available, the thickness of a switch is small and the thing 0.6mm or less is known, for example. A data code will read and the control section 68 as an image pick-up section control section will be continued in the meantime, if it continues pushing this touch sensor 52 with a finger. And reading is stopped in the place where the finger was lifted from this touch sensor 52. Moreover, the control section 68 as a voice playback control section will reproduce the memorized voice data, if this touch sensor 52 is double-clicked with a finger.

[0027]

[Effect of the Invention] As mentioned above, according to this invention, it can use for cards or the study card of cards appearance, and has the study effectiveness of reading a reading tag, and printed matter with a data code reproducible [ with equipment ] moreover is offered. Moreover, according to the printed matter with a data code of this invention with which the 2-dimensional dot code which arranged the dot to two dimensions is printed by the data-code printing part, since the 2-dimensional dot code is printed, the amount of information per unit area can record large prolonged speech information, and repetition playback can be performed.

[0028] Moreover, it is the data-code reader which reads optically the data-code printing part which contains speech information at least, and according to the data-code reader of this invention which has the repeat switch which repeats playback of speech information, since it has the repeat switch which repeats playback of speech information, the data-code reader which can perform asking again repeatedly easily is offered. Moreover, according to the data-code reader of this invention which a data-code reader is a pen mold reader which reads a data-code printing part by manual scan, and is the switch of the push button mold with which the repeat switch was formed in the pen mold reader, the data-code reader is small and can perform reading of a data-code printing part and a reproductive repeat by very easy actuation.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is drawing of the printed matter with a data code of this invention in which coming out on the other hand, and showing an example of a certain two or more alphabetic character printed matter and data-code reader.

[Drawing 2] It is drawing showing two or more pattern printed matter which is another side of the printed matter with a data code of this invention.

[Drawing 3] It is drawing showing an example of the configuration of a 2-dimensional data code.

[Drawing 4] It is drawing explaining the detail of a 2-dimensional data code shown in drawing 3 .

[Drawing 5] It is drawing showing an example of the configuration of the data code of a pen mold.

[Description of Notations]

- 1a. 1b, 1c Printed matter with a data code
- 2 Data-Code Reader
- 3 Repeat Button Switch
- 4 Scan Button Switch
- 5 Printer Graphic Part
- 6 Data-Code Printing Part
- 7a, 7b, 7c, 7d, 7e, 7f Pattern printed matter
- 41 Dot Code
- 42 Block
- 43 Marker
- 44 Block Address
- 45 Error Correction Data
- 46 Data Area
- 48 Dummy Marker
- 49 Data Dot
- 50 Earphone
- 51 Pen Mold Data-Code Reader
- 52 Touch Sensor
- 60 Light Source
- 61 Lens
- 62 Spatial Filter
- 63 Image Pick-up Section
- 64 Amplifier
- 65 Image-Processing Section
- 66 Data-Processing Section
- 67 Data Output Section
- 68 Control Section
- 69 Dc-battery

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